Challenges in Developing an Integrated, National-Scale Assessment of the Condition of Coastal Wetlands: Survey Design

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Background

EPA Office of Water's Schedule for Surveys of the Nation's Waters targets FY11 for conducting a National Wetlands Survey, to include both inland and coastal wetlands. The Office of Research and Development (ORD) will build upon the monitoring strategies of EPA's Environmental Monitoring and Assessment Program's (EMAP) National Coastal Assessment (NCA) and Wadable Streams Assessment to develop approaches to assess the ecological condition of coastal wetlands and shallow, near-coastal habitats at regional and national scales. Evaluating the condition of coastal wetlands, particularly over large geographic scales, is complicated because the properties of wetlands vary temporally, spatially, and by type, and these variations affect the functional roles of wetlands in the ecosystem. ORD's initial research will provide ecological definitions, sample frames, and survey designs for coastal wetlands at national and regional scales. Future efforts will include the development of indicators, field and laboratory methods, quality assurance protocols, and information management.

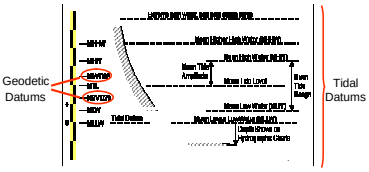
Keys to a successful strategy

A national coastal wetland monitoring and assessment strategy should:

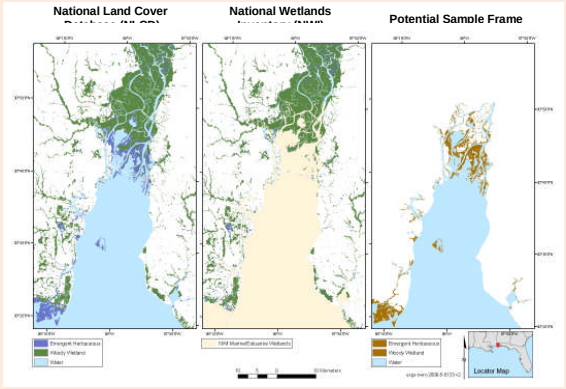
- build on the work of EPA and EPA partners who are currently engaged in the planning and implementation of coastal wetland monitoring activites (e.g, ORD, CA, VA, MA CZM etc.)
- smoothly link to inland wetland surveys to effectively generate national wetland assessments
- generate a sample frame that balances available GIS capability with ecological knowledge of coastal wetland systems
- benefit from the close coordination of the national wetland program office, with the Regions, States and ORD's research team

Defining the Sample Frame

Currently we define coastal wetlands as the "coastal vegetated fringe and adjacent shallow water habitats." To represent this coastal wetland resource definition spatially, we need to use nationally-consistent datasets. Elevation and depth contour boundaries are generally inconsistent, do not cover the entire resource, and not available for the entire US coastline.

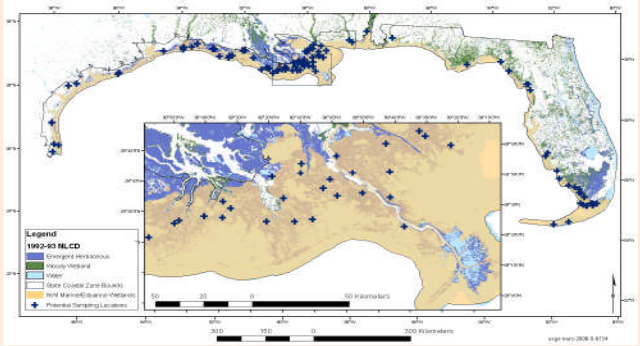


Existing national wetland geographic databases may be used to define a coastal wetland sample frame. This example illustrates how the NLCD emergent and woody wetlands can be overlaid with the marine or estuarine NWI classes to define this patchy resource spatially. Near-coastal shallow water habitats (i.e., SAV, mudflats, oyster reefs) included in our suggested definition for coastal wetlands are not illustrated here.



A Demonstration Survey Design: Gulf of Mexico

Using an acceptable wetland sample frame (here, derived from the NLCD and NWI datasets that fall within the Coastal Zone boundaries as an example), a probabilistic survey design may be generated to assess the condition of coastal wetlands of the Gulf of Mexico.



Next steps toward implementation of a National Coastal Wetlands Assessment:

- Application of national condition indicators to a 3-tiered assessment of coastal wetlands
  - Tier 1 – Landscape Assessment
  - Tier 2 – Rapid Wetland Assessment
  - Tier 3 – Intensive Site Assessment
- Close coordination with National Wetland Program Office, Regions, States, and ORD's research team to reach a consensus on defining the resource, refining the list of condition indicators, and sampling approaches to conduct a national assessment from a design that allows for assessment on different scales.
- Gulf of Mexico Pilot study to test the application and approach and indicators at a regional scale.

Credits: Thank you to Yvonne Allen for producing the graphics of the poster.